

REMARKS/ARGUMENTS

Claims 1-6 are present in this application. By this Amendment, claim 1 has been amended, and claim 7 has been canceled. Reconsideration in view of the above amendments and the following remarks is respectfully requested.

Entry of this Amendment is proper under 37 C.F.R. §1.116 because the Amendment: (a) places the application in condition for allowance for the reasons discussed herein; (b) does not raise any new issues requiring further search and/or consideration (since the amendments amplify issues previously discussed throughout prosecution and raised by the Examiner in the previous Office Action; (c) does not present any additional claims without canceling the corresponding number of finally-rejected claims; and (d) places the application in better form for appeal, should an appeal be necessary. The Amendment was necessary and was not earlier presented because it is made in response to arguments raised in the final rejection. Entry of the Amendment is thus respectfully requested.

Without conceding the Examiner's commentary in paragraphs 2-7 of the Office Action, claim 1 has been amended to more clearly distinguish the invention from the applied references. For the reasons discussed below, Applicant respectfully submits that the rejection should be withdrawn.

Claims 1, 3, 5 and 7 were rejected under 35 U.S.C. §103(a) over U.S. Patent No. 4,912,318 to Kajiura et al. in view of U.S. Patent No. 3,202,761 to Bibbero. This rejection is respectfully traversed.

Claim 1 has been amended to recite that the first and second electronic cameras simultaneously pick up first and second images of a plurality of test tubes held in a test tube rack Support for this amendment can be found, for example, in the specification at page 4, lines

3-20 and Fig. 1. That is, with reference to Fig. 1, the test tube rack 2 is conveyed in the direction A as shown. The first and second cameras 11 and 12 pick up images as the test tubes pass. Fig. 1 shows the cameras 11, 12 in alignment relative to the conveyance direction, and as such, the images are picked up simultaneously.

In Kajiura, the imaging devices 12a-12g image respective surfaces to be inspected. When the products 1 are phials, the top face, head side, shoulder side of containers, side, surface of contents, and bottom face can be inspected (col. 4, lines 9-13). The imaging devices 12a-12g do not simultaneously image respective surfaces to be inspected.

Fig. 4A shows the position of the imaging device 12a to inspect the side of the product 1, where the product 1 is imaged through a mirror 14a provided on the forward side. In Fig. 4B, an arrow 30 indicates the inspection line of the imaging device 12a in Fig. 4A (col. 4, lines 21-25). That is, Figs. 4A and 4B show inspection of the side of the product 1 with the imaging device 12a. Fig. 5A shows the position of the imaging device 12b to inspect the bottom face of the product 1, where the product 1 is imaged through a slit 15 provided on the bottom of the product 1 and then mirrors 14b and 14c on the lower side. In Fig. 5B, an arrow 31 is the inspection line of the imaging device 12b in Fig. 5A (col. 4, lines 26-32). That is, Figs. 5A and 5B show inspection of the bottom face of the product 1 with the imaging device 12b.

The indexing turn table 6, which is a disk turned intermittently in one direction, repeats a turn and stop motion each for a certain time (col. 4, lines 1-3). The product 1 is held by being nipped at the peripheral surface near its bottom by a pair of rollers 9, 9 and the disk turn table 10, and is rotated on its own axis by the turn of the disk turn table 10 (col. 4, lines 37-39).

Therefore, after the side of the product 1 is imaged by the imaging device 12a, the indexing turn table 6 and the disk turn table 10 then rotate in the one direction by a certain degree. After that, the imaging device 12b images the bottom face of the product 1.

The inspection could be adversely affected by the rotation of the turn table between the imaging devices 12a and 12b. In contrast, the test tube type discrimination apparatus of the claimed invention is not affected by such rotation because the first and second electronic cameras simultaneously pick up first and second images of a test tube.

In Kajiura, if the intensity of reflection light of the product 1 is set to be equal to that of transmission light, the presence of a defect (such as dirt and foreign matter), differing in clearness from a nondefective product, can be detected by image processing the product 1 imaged (col. 6, lines 8-11). Fig. 10A and Fig. 10B show the product 1 and the related wave form observed by imaging and image processing the product 1, respectively. In Fig. 10A, defects 43 (such as dirt and foreign matter) are present on the wall in the portion in which the powder 42 is contained and in a cavity portion 44, respectively, in the product 1 such as a phial. At this time, a part of the powder 42 adheres to the wall of the cavity 44. Under such condition, when the product 1 is lighted by the lighting devices for inspection, shown in Fig. 7 through Fig. 9, to be imaged and appearance inspected, the wave form obtained is uniform regardless of the portion contained with the powder 42 and of the cavity portion 44, allowing only the presence of the defects 43 to be evidently detected (in Fig. 10B, numerals 45 reference the presence of defects) (see col. 6, lines 39-54).

Therefore, the defects such as dirt and foreign matter adhering to the wall of the product 1 can be detected by the inspection equipment of Kajiura. The detection is performed based on

the obtained wave form. Kajiura lacks any description relating to edge extraction from the picked up first and second images.

The invention of Bibbero includes means for sensing an object, symbol image or other phenomenon and for conversion of the sensed impression into an electrical impulse or waveform. This waveform is compared to a number of waveforms stored in the system's memory, and the best match is selected (col. 2, lines 29-34). Bibbero, however, similarly does not teach edge extraction from the picked up first and second images as claimed.

Applicant thus respectfully submits that the rejection is misplaced.

With regard to dependent claims 3 and 5, Applicant submits that these claims are allowable at least by virtue of their dependency on an allowable independent claim.

Reconsideration and withdrawal of the rejection are respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully submits that the claims are patentable over the art of record and that the application is in condition for allowance. Should the Examiner believe that anything further is desirable in order to place the application in condition for allowance, the Examiner is invited to contact Applicant's undersigned attorney at the telephone number listed below.

Prompt passage to issuance is earnestly solicited.

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Respectfully submitted,

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